

EMI TEST REPORT

Test Report No. : 31GE0243-HO-B

Applicant : SHARP CORPORATION
Type of Equipment : Cellular Phone
Model No. : SH-10C
FCC ID : APYHRO00145
Test standard : FCC Part 15 Subpart B 2010 Class B
Test Result : Complied

1. This test report shall not be reproduced in full or partial, without the written approval of UL Japan, Inc.
2. The results in this report apply only to the sample tested.
3. This sample tested is in compliance with the above regulation.
4. The test results in this report are traceable to the national or international standards.
5. This test report must not be used by the customer product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

Date of test: March 28 and 29, 2011

Representative test engineer:



Hiroyuki Furutaka
Engineer of WiSE Japan,
UL Verification Service

Approved by:



Yutaka Yoshida
Leader of WiSE Japan,
UL Verification Service



NVLAP LAB CODE: 200572-0

This laboratory is accredited by the NVLAP LAB CODE 200572-0, U.S.A. The tests reported herein have been performed in accordance with its terms of accreditation. *As for the range of Accreditation in NVLAP, you may refer to the WEB address, <http://www.ul.com/japan/jpn/pages/services/emc/about/mark1/index.jsp#nvlap>

CONTENTS **PAGE**

SECTION 1: Customer information3
SECTION 2: Equipment under test (E.U.T.)3
SECTION 3: Test specification, procedures & results4
SECTION 4: Operation of E.U.T. during testing7
SECTION 5: Conducted Emission9
SECTION 6: Radiated Emission10
APPENDIX 1: Photographs of test setup.....11
 Conducted Emission 11
 Radiated Emission 12
APPENDIX 2: Data of EMI test13
 Conducted Emission 13
 Radiated Emission 15
APPENDIX 3: Test instruments19

SECTION 1: Customer information

Company Name : SHARP CORPORATION
Address : 2-13-1 Iida, Hachihonmatsu, Higashi-Hiroshima City, Hiroshima, 739-0192 Japan
Telephone Number : +81-82-420-1825
Facsimile Number : +81-82-420-1829
Contact Person : Kazuo Sugimoto

SECTION 2: Equipment under test (E.U.T.)

2.1 Identification of E.U.T.

Type of Equipment : Cellular Phone
Model No. : SH-10C
Serial No. : Refer to Section 4, Clause 4.2
Receipt Date of Sample : March 19, 2011
Country of Mass-production : Japan
Condition of EUT : Production prototype
(Not for Sale: This sample is equivalent to mass-produced items.)
Modification of EUT : No Modification by the test lab

2.2 Product description

Feature of EUT : Tetra-band (800/850/1700/2000)WCDMA & GSM Dual mode Cellular Phone / Bluetooth/W-LAN , Felica & 1.5GHz Band Satellite Receiver (GPS) enable
- GSM (EU:900/1800M, 1900M)
- WCDMA (EU:2000M, USA:850, JPN: 800/1700/2000)
Clock frequencies in the system : CPU: 500.5MHz
Source oscillation: 48MHz

UL Japan, Inc.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

SECTION 3: Test specification, procedures & results

3.1 Test specification

Test Specification : FCC Part 15 Subpart B: 2010, final revised on December 6, 2010 and effective January 5, 2011

Title : FCC 47CFR Part15 Radio Frequency Device
Subpart B Unintentional Radiators

3.2 Procedures and results

Item	Test Procedure	Limits	Deviation	Worst margin	Result
Conducted emission	ANSI C63.4: 2003 7. AC powerline conducted emission measurements	Class B	N/A	[QP] 16.0dB 3.74674MHz, N [AV] 15.1dB 3.74674MHz, N	Complied
Radiated emission	ANSI C63.4: 2003 8. Radiated emission measurements	Class B	N/A	7.7dB 797.808MHz, Horizontal, QP	Complied

*Note: UL Japan, Inc's EMI Work Procedure QPM05.

3.3 Addition to standard

No addition, exclusion nor deviation has been made from the standard.

UL Japan, Inc.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

3.4 Uncertainty

EMI

The following uncertainties have been calculated to provide a confidence level of 95% using a coverage factor k=2.

Test room (semi-anechoic chamber)	Conducted emission (+dB)
	150kHz-30MHz
No.1	3.1dB
No.2	3.3dB
No.3	3.7dB
No.4	3.2dB

Test room (semi-anechoic chamber)	Radiated emission						
	(3m*)(+dB)				(1m*)(+dB)		(0.5m*)(+dB)
	9kHz -30MHz	30MHz -300MHz	300MHz -1GHz	1GHz -10GHz	10GHz -18GHz	18GHz -26.5GHz	26.5GHz -40GHz
No.1	3.5dB	5.1dB	5.2dB	4.8dB	5.1dB	4.4dB	4.3dB
No.2	4.0dB	5.1dB	5.2dB	4.8dB	5.0dB	4.3dB	4.2dB
No.3	4.2dB	4.7dB	5.2dB	4.8dB	5.0dB	4.5dB	4.2dB
No.4	4.0dB	5.0dB	5.1dB	4.8dB	5.0dB	5.1dB	4.2dB

*3m/1m/0.5m = Measurement distance

Conducted Emission test

The data listed in this test report has enough margin, more than the site margin.

Radiated emission test(3m)

The data listed in this test report has enough margin, more than the site margin.

UL Japan, Inc.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

3.5 Test Location

UL Japan, Inc. Head Office EMC Lab. *NVLAP Lab. code: 200572-0
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN
Telephone : +81 596 24 8116 Facsimile : +81 596 24 8124

	FCC Registration Number	IC Registration Number	Width x Depth x Height (m)	Size of reference ground plane (m) / horizontal conducting plane	Other rooms
No.1 semi-anechoic chamber	313583	2973C-1	19.2 x 11.2 x 7.7m	7.0 x 6.0m	No.1 Power source room
No.2 semi-anechoic chamber	655103	2973C-2	7.5 x 5.8 x 5.2m	4.0 x 4.0m	-
No.3 semi-anechoic chamber	148738	2973C-3	12.0 x 8.5 x 5.9m	6.8 x 5.75m	No.3 Preparation room
No.3 shielded room	-	-	4.0 x 6.0 x 2.7m	N/A	-
No.4 semi-anechoic chamber	134570	2973C-4	12.0 x 8.5 x 5.9m	6.8 x 5.75m	No.4 Preparation room
No.4 shielded room	-	-	4.0 x 6.0 x 2.7m	N/A	-
No.5 semi-anechoic chamber	-	-	6.0 x 6.0 x 3.9m	6.0 x 6.0m	-
No.6 shielded room	-	-	4.0 x 4.5 x 2.7m	4.75 x 5.4 m	-
No.6 measurement room	-	-	4.75 x 5.4 x 3.0m	4.75 x 4.15 m	-
No.7 shielded room	-	-	4.7 x 7.5 x 2.7m	4.7 x 7.5m	-
No.8 measurement room	-	-	3.1 x 5.0 x 2.7m	N/A	-
No.9 measurement room	-	-	8.0 x 4.5 x 2.8m	2.0 x 2.0m	-
No.10 measurement room	-	-	2.6 x 2.8 x 2.5m	2.4 x 2.4m	-
No.11 measurement room	-	-	3.1 x 3.4 x 3.0m	2.4 x 3.4m	-

* Size of vertical conducting plane (for Conducted Emission test) : 2.0 x 2.0m for No.1, No.2, No.3, and No.4 semi-anechoic chambers and No.3 and No.4 shielded rooms.

3.6 Test set up, Data of EMI, and Test instruments

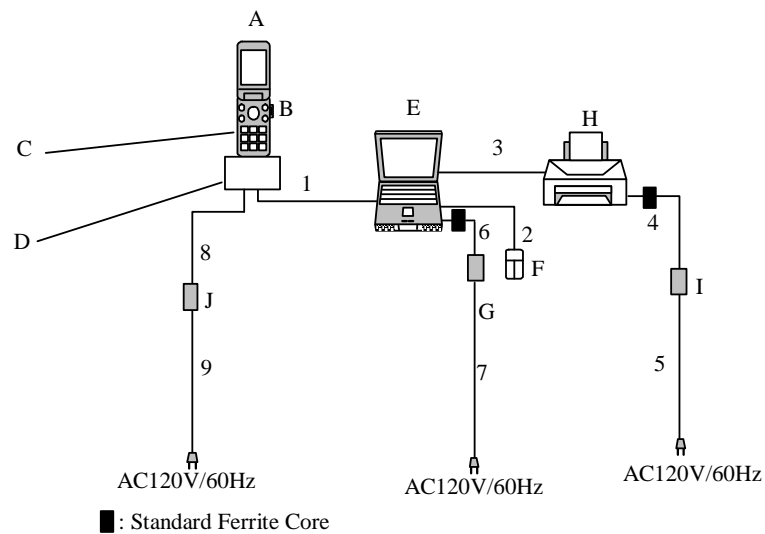
Refer to APPENDIX.

SECTION 4: Operation of E.U.T. during testing

4.1 Operating modes

The mode(s) : 1) USB Data Com Mode
The USB data is communicated between EUT and Personal computer (Pair of EUT).
2) Standby Mode
Standby state for USB communication.

4.2 Configuration and peripherals



*Cabling and setup were taken into consideration and test data was taken under worse case conditions.

Description of EUT and Support equipment

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	Cellular Phone	SH-10C	004401113245209	Sharp Corporation	EUT
B	microSD Memory Card	SD-C08G	0852K93900Y	Toshiba	-
C	Lithium-Ion Battery	Battery Pack SH27	-	Sharp Corporation	EUT
D	Desktop Holder	SH35	UBA	Sharp Corporation	EUT
E	Personal Computer	PP11L	CN-0D4571-48643-58P-1053	DELL	-
F	Mouse	M-UAG120	G83C0007F310	Toshiba	-
G	AC Adapter (PC)	PA-1650-05D2	CN-0F7970-71615-77H-0D63	DELL	-
H	Printer	C6410A	8G8BA1W18J	Hewlett Packard	-
I	AC Adaptor(Printer)	AT-3018A-0101	C4557-60004	Hewlett Packard	-
J	AC Adaptor(set)	MAS-BH0008-A002	-	NEC	-

List of cables used

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	USB Data Cable	0.80	Shielded	Shielded	-
2	Mouse Cable	0.71	Shielded	Shielded	-
3	Printer Cable	2.00	Shielded	Shielded	-
4	DC Power Cable(Printer)	2.00	Unshielded	Unshielded	-
5	AC Power Cable(Printer)	1.80	Unshielded	Unshielded	-
6	DC Power Cable(PC)	1.80	Unshielded	Unshielded	-
7	AC Power Cable(PC)	0.90	Unshielded	Unshielded	-
8	DC Power Cable(Set)	1.5	Unshielded	Unshielded	-
9	AC Power Cable(Set)	0.56 2.00 *1)	Unshielded	Unshielded	-

*1) Used for Conducted emission test only.

UL Japan, Inc.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

SECTION 5: Conducted Emission

5.1 Operating environment

Test place : No.1 semi anechoic chamber.
Temperature : See data
Humidity : See data

5.2 Test configuration

EUT was placed on a urethane platform of nominal size, 1.0m by 1.5m, raised 0.8m above the conducting ground plane. The rear of tabletop was located 40cm to the vertical conducting plane. The rear of EUT and its peripherals was aligned and flushed with rear of tabletop. All other surfaces of tabletop were at least 80cm from any other grounded conducting surface. EUT was located 80cm from the LISN/AMN and excess AC cable was bundled in center. I/O cables that were connected to the other peripherals were bundled in center. They were folded back and forth forming a bundle 30cm to 40cm long and were hanged at a 40cm height to the ground plane. Each EUT current-carrying power lead, except the ground (safety) lead, was individually connected through a LISN/AMN to the input power source. All unused 50 ohm connectors of the LISN/AMN were resistivity terminated in 50 ohm when not connected to the measuring equipment. Photographs of the set up are shown in Appendix 1.

Frequency range : 0.15 MHz-30MHz
EUT position : Table top
EUT operation mode : See Clause 4.1

5.3 Test procedure

The AC Mains Terminal Continuous disturbance Voltage has been measured with the EUT within a semi anechoic chamber. The EUT was connected to a Line Impedance Stabilization Network (LISN)/ Artificial Mains network (AMN). An overview sweep with peak detection has been performed. The measurements have been performed with a quasi-peak detector and if required, with an average detector.

The conducted emission measurements were made with the following detector function of the test receiver.

Detector Type : Quasi-Peak and Average
IF Bandwidth : 9 kHz

5.4 Test result

Summary of the test results: Pass

Date: March 29, 2011

Test engineer: Hiroyuki Furutaka

UL Japan, Inc.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

SECTION 6: Radiated Emission

6.1 Operating environment

Test place : No.1 semi anechoic chamber
Temperature : See data
Humidity : See data

6.2 Test configuration

EUT was placed on a urethane platform of nominal size, 1.0m by 1.5m, raised 0.8m above the conducting ground plane. The EUT was set on the edge of the tabletop.
Test was made with the antenna positioned in both the horizontal and vertical planes of polarization. The measurement antenna was varied in height above the conducting ground plane to obtain the maximum signal strength. Photographs of the set up are shown in Appendix 1.

6.3 Test conditions

Frequency range : 30MHz-300MHz (Biconical antenna) / 300MHz-1000MHz (Logperiodic antenna)
1000MHz - 5000MHz (Horn antenna)
Test distance : 3m
EUT position : Table top
EUT operation mode : See Clause 4.1

6.4 Test procedure

The height of the measuring antenna varied between 1 and 4m and EUT was rotated a full revolution in order to obtain the maximum value of the electric field intensity.
The measurements were performed for both vertical and horizontal antenna polarization with the Test Receiver, or the Spectrum Analyzer.
The radiated emission measurements were made with the following detector function of the test receiver and the Spectrum analyzer.

Frequency	Below 1GHz	Above 1GHz
Instrument used	Test Receiver	Spectrum Analyzer
IF Bandwidth	QP: BW 120kHz	PK: RBW:1MHz/VBW: 3MHz AV *1): RBW:1MHz/VBW:10Hz

*1) When using Spectrum analyzer, the test was made with adjusting span to zero by using peak hold.

- The test was made on EUT at the normal use position.

6.5 Test result

Summary of the test results: Pass

Date: March 28, 2011

Test engineer: Hiroyuki Furutaka

UL Japan, Inc.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

APPENDIX 1: Photographs of test setup

Conducted Emission

This page has been submitted for a separate exhibit.

Radiated Emission

This page has been submitted for a separate exhibit.

APPENDIX 2: Data of EMI test

Conducted Emission

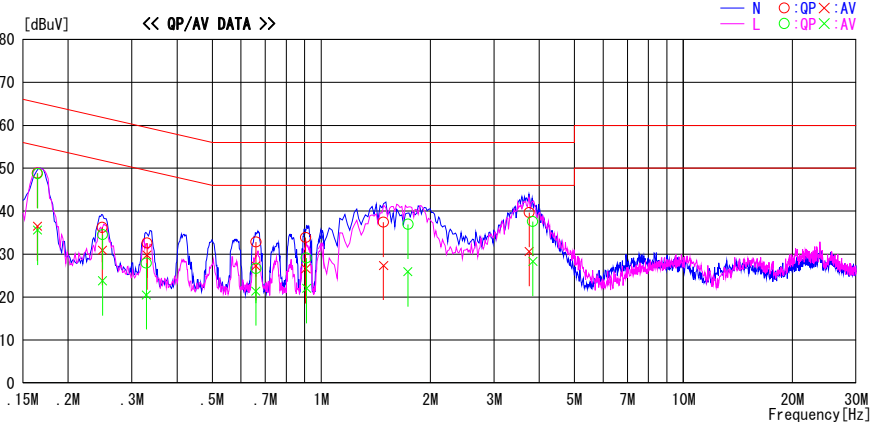
DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No. 1 Semi Anechoic Chamber
Date : 2011/03/29

Report No. : 31GE0243-HO
Temp./Humi. : 23deg. C / 33% RH
Engineer : Hiroyuki Furutaka

Mode / Remarks : USB Date Com Mode

LIMIT : FCC15.107(a) QP
FCC15.107(a) AV



Frequency [MHz]	Reading Level		Corr. Factor [dB]	Results		Limit		Margin		Phase	Comment
	QP [dBuV]	AV [dBuV]		QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	QP [dB]	AV [dB]		
0.16453	35.6	23.3	13.2	48.8	36.5	65.2	55.2	16.4	18.7	N	
0.24881	22.9	17.6	13.3	36.2	30.9	61.8	51.8	25.6	20.9	N	
0.33016	19.3	16.5	13.3	32.6	29.8	59.4	49.4	26.8	19.6	N	
0.65998	19.5	14.0	13.3	32.8	27.3	56.0	46.0	23.2	18.7	N	
0.90681	20.5	13.2	13.4	33.9	26.6	56.0	46.0	22.1	19.4	N	
1.48567	23.9	13.9	13.5	37.4	27.4	56.0	46.0	18.6	18.6	N	
3.74898	25.9	16.8	13.8	39.7	30.6	56.0	46.0	16.3	15.4	N	
0.16487	35.5	22.4	13.2	48.7	35.6	65.2	55.2	16.5	19.6	L	
0.24909	21.2	10.5	13.3	34.5	23.8	61.8	51.8	27.3	28.0	L	
0.32895	14.6	7.2	13.3	27.9	20.5	59.5	49.5	31.6	29.0	L	
0.66017	13.4	8.1	13.3	26.7	21.4	56.0	46.0	29.3	24.6	L	
0.91022	15.7	8.6	13.4	29.1	22.0	56.0	46.0	26.9	24.0	L	
1.73547	23.4	12.4	13.5	36.9	25.9	56.0	46.0	19.1	20.1	L	
3.83887	23.8	14.5	13.8	37.6	28.3	56.0	46.0	18.4	17.7	L	

CHART: WITH FACTOR, Peak hold data. CALCULATION: RESULT[dBuV]=READING[dBuV]+C.F[dB] (L1SN LOSS+CABLE LOSS+ATTENATOR LOSS)
Except for the above table : adequate margin data below the limits.

*The test result is rounded off to one or two decimal places, so some differences might be observed.

Conducted Emission

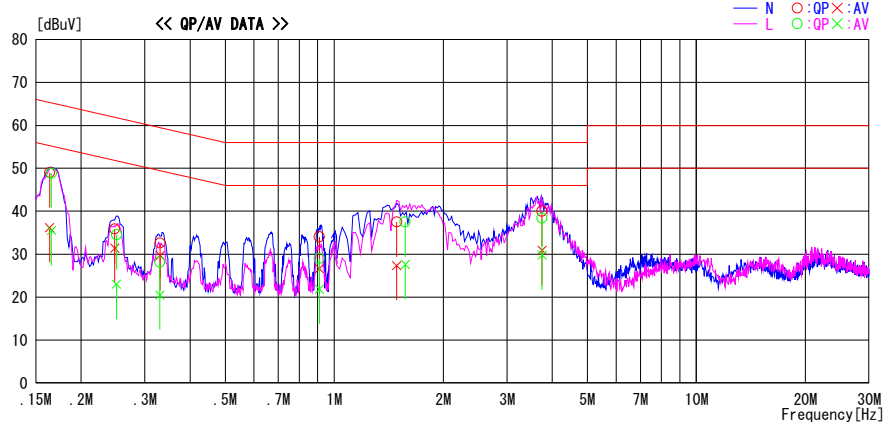
DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No.1 Semi Anechoic Chamber
Date : 2011/03/29

Report No. : 31GE0243-HO
Temp./Humi. : 23deg. C / 33% RH
Engineer : Hiroyuki Furutaka

Mode / Remarks : Standby Mode

LIMIT : FCC15.107(a) QP
FCC15.107(a) AV



Frequency [MHz]	Reading Level		Corr. Factor [dB]	Results		Limit		Margin		Phase	Comment
	QP [dBuV]	AV [dBuV]		QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	QP [dB]	AV [dB]		
0.16369	35.8	23.0	13.2	49.0	36.2	65.3	55.3	16.3	19.1	N	
0.24749	22.6	18.1	13.3	35.9	31.4	61.8	51.8	25.9	20.4	N	
0.33046	19.3	16.4	13.3	32.6	29.7	59.4	49.4	26.8	19.7	N	
0.90961	20.6	13.2	13.4	34.0	26.6	56.0	46.0	22.0	19.4	N	
1.48760	24.0	13.9	13.5	37.5	27.4	56.0	46.0	18.5	18.6	N	
3.74674	26.2	17.1	13.8	40.0	30.9	56.0	46.0	16.0	15.1	N	
0.16563	35.6	22.3	13.2	48.8	35.5	65.2	55.2	16.4	19.7	L	
0.25050	21.2	9.7	13.3	34.5	23.0	61.7	51.7	27.2	28.7	L	
0.32985	14.8	7.2	13.3	28.1	20.5	59.5	49.5	31.4	29.0	L	
0.90941	15.6	8.5	13.4	29.0	21.9	56.0	46.0	27.0	24.1	L	
1.57051	24.0	14.1	13.5	37.5	27.6	56.0	46.0	18.5	18.4	L	
3.74649	24.6	16.0	13.8	38.4	29.8	56.0	46.0	17.6	16.2	L	

CHART: WITH FACTOR, Peak hold data. CALCULATION: RESULT [dBuV]=READING [dBuV]+C.F [dB] (L1SN LOSS+CABLE LOSS+ATTENATOR LOSS)
Except for the above table : adequate margin data below the limits.

*The test result is rounded off to one or two decimal places, so some differences might be observed.

Radiated Emission

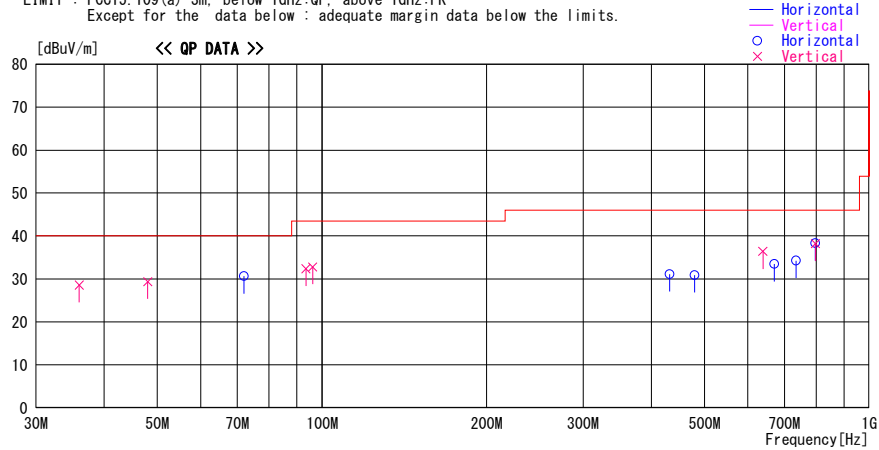
DATA OF RADIATED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No.1 Semi Anechoic Chamber
Date : 2011/03/28

Report No. : 31GE0243-HO
Temp./Humi. : 22deg. C / 31% RH
Engineer : Hiroyuki Furutaka

Mode / Remarks : USB Date Com Mode Normal Axis

LIMIT : FCC15.109(a) 3m, below 1GHz:QP, above 1GHz:PK
Except for the data below : adequate margin data below the limits.



Frequency [MHz]	Reading [dBuV]	DET	Antenna		Level [dBuV/m]	Angle [Deg]	Height [cm]	Polar.	Limit [dBuV/m]	Margin [dB]	Comment
			Factor [dB/m]	Loss&Gain [dB]							
36.005	46.5	QP	16.0	-33.9	28.6	10	100	Vert.	40.0	11.4	
48.005	51.4	QP	11.5	-33.5	29.4	136	100	Vert.	40.0	10.6	
72.010	57.4	QP	6.4	-33.2	30.6	115	250	Hori.	40.0	9.4	
93.527	56.6	QP	8.5	-32.7	32.4	140	100	Vert.	43.5	11.1	
96.134	56.4	QP	9.0	-32.6	32.8	164	100	Vert.	43.5	10.7	
431.985	42.1	QP	18.2	-29.2	31.1	134	100	Hori.	46.0	14.9	
479.299	41.4	QP	18.5	-29.0	30.9	131	100	Hori.	46.0	15.1	
639.078	43.9	QP	20.5	-28.0	36.4	346	100	Vert.	46.0	9.6	
671.036	40.5	QP	20.7	-27.8	33.4	155	100	Hori.	46.0	12.6	
734.943	40.1	QP	21.4	-27.2	34.3	152	100	Hori.	46.0	11.7	
798.150	42.9	QP	22.1	-26.8	38.2	68	166	Vert.	46.0	7.8	
797.808	43.0	QP	22.1	-26.8	38.3	155	100	Hori.	46.0	7.7	

CHART: WITH FACTOR ANT TYPE: -30MHz: LOOP, 30-300MHz: BICONICAL, 300MHz-1000MHz: LOGPERIODIC, 1000MHz-: HORN
CALCULATION: RESULT = READING + ANT FACTOR + LOSS (CABLE+ATTEN.) - GAIN (AMP)

*The limit is rounded down to one decimal place.

*The test result is rounded off to one or two decimal places, so some differences might be observed.

Radiated Emission

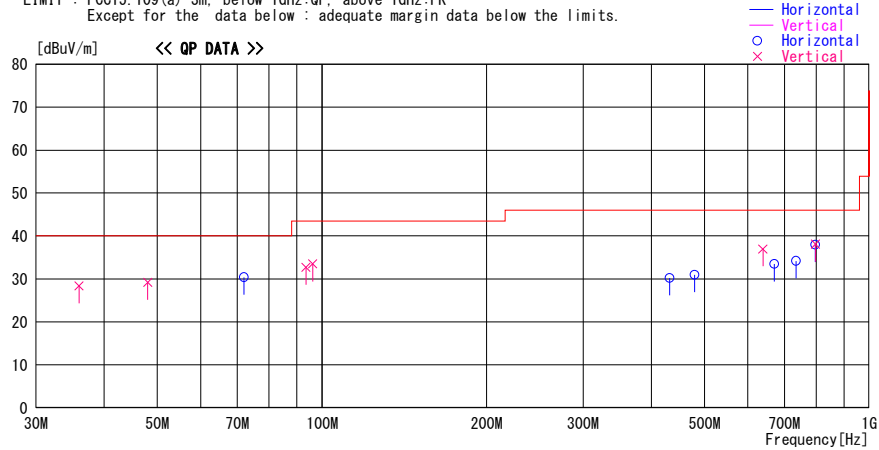
DATA OF RADIATED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No.1 Semi Anechoic Chamber
Date : 2011/03/28

Report No. : 31GE0243-HO
Temp./Humi. : 22deg. C / 31% RH
Engineer : Hiroyuki Furutaka

Mode / Remarks : Standby Mode Normal Axis

LIMIT : FCC15.109(a) 3m, below 1GHz:QP, above 1GHz:PK
Except for the data below : adequate margin data below the limits.



Frequency [MHz]	Reading [dBuV]	DET	Antenna		Level [dBuV/m]	Angle [Deg]	Height [cm]	Polar.	Limit [dBuV/m]	Margin [dB]	Comment
			Factor [dB/m]	Loss&Gain [dB]							
35.997	46.3	QP	16.0	-33.9	28.4	235	100	Vert.	40.0	11.6	
48.004	51.2	QP	11.5	-33.5	29.2	131	100	Vert.	40.0	10.8	
72.008	57.2	QP	6.4	-33.2	30.4	120	241	Hori.	40.0	9.6	
93.513	56.9	QP	8.5	-32.7	32.7	135	100	Vert.	43.5	10.8	
96.135	57.1	QP	9.0	-32.6	33.5	163	100	Vert.	43.5	10.0	
431.985	41.2	QP	18.2	-29.2	30.2	5	100	Hori.	46.0	15.8	
479.299	41.5	QP	18.5	-29.0	31.0	137	100	Hori.	46.0	15.0	
639.075	44.5	QP	20.5	-28.0	37.0	347	100	Vert.	46.0	9.0	
671.036	40.6	QP	20.7	-27.8	33.5	157	100	Hori.	46.0	12.5	
734.943	40.0	QP	21.4	-27.2	34.2	154	100	Hori.	46.0	11.8	
798.199	42.8	QP	22.1	-26.8	38.1	70	100	Vert.	46.0	7.9	
797.807	42.7	QP	22.1	-26.8	38.0	155	100	Hori.	46.0	8.0	

CHART: WITH FACTOR ANT TYPE: -30MHz: LOOP, 30-300MHz: BICONICAL, 300MHz-1000MHz: LOGPERIODIC, 1000MHz-: HORN
CALCULATION: RESULT = READING + ANT FACTOR + LOSS (CABLE+ATTEN.) - GAIN (AMP)

*The limit is rounded down to one decimal place.

*The test result is rounded off to one or two decimal places, so some differences might be observed.

Radiated Emission

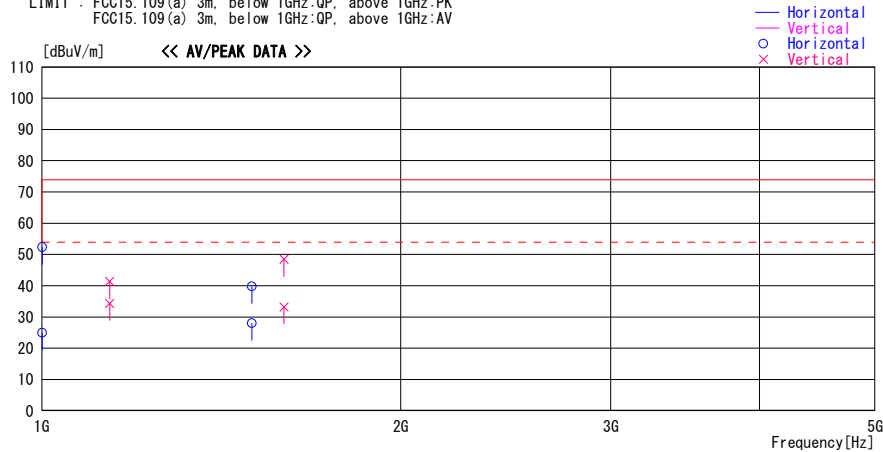
DATA OF RADIATED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No.1 Semi Anechoic Chamber
Date : 2011/03/28

Report No. : 31GE0243-HO
Temp./Humi. : 22deg. C / 31% RH
Engineer : Hiroyuki Furutaka

Mode / Remarks : USB Date Com Mode Normal Axis

LIMIT : FCC15.109(a) 3m, below 1GHz:QP, above 1GHz:PK
FCC15.109(a) 3m, below 1GHz:QP, above 1GHz:AV



Frequency [MHz]	Reading [dBuV]	DET	Antenna	Loss&	Level	Angle	Height	Polar.	Limit	Margin	Comment
			Factor [dB/m]	Gain [dB]							
1000.385	64.3	PK	23.9	-35.8	52.4	345	100	Hori.	73.9	21.5	
1000.385	36.8	AV	23.9	-35.8	24.9	345	100	Hori.	53.9	29.0	
1139.965	45.2	AV	24.4	-35.3	34.3	320	128	Vert.	53.9	19.6	
1139.965	52.3	PK	24.4	-35.3	41.4	320	128	Vert.	73.9	32.5	
1499.990	49.1	PK	25.3	-34.6	39.8	53	100	Hori.	73.9	34.1	
1499.990	37.3	AV	25.3	-34.6	28.0	53	100	Hori.	53.9	25.9	
1595.900	57.4	PK	25.6	-34.5	48.5	103	107	Vert.	73.9	25.4	
1595.900	42.1	AV	25.6	-34.5	33.2	103	107	Vert.	53.9	20.7	

CHART:WITH FACTOR ANT TYPE: -30MHz:LOOP, 30-300MHz:BICONICAL, 300MHz-1000MHz:LOGPERIODIC, 1000MHz-:HORN
CALCULATION:RESULT = READING + ANT FACTOR + LOSS(CABLE+ATTEN.) - GAIN(AMP)

*The limit is rounded down to one decimal place.
*The test result is rounded off to one or two decimal places, so some differences might be observed.

Radiated Emission

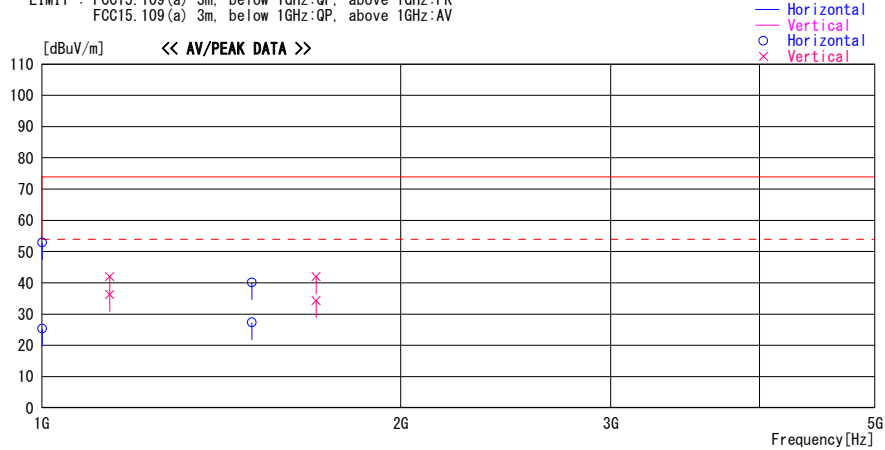
DATA OF RADIATED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No.1 Semi Anechoic Chamber
Date : 2011/03/28

Report No. : 31GE0243-HO
Temp./Humi. : 22deg. C / 31% RH
Engineer : Hiroyuki Furutaka

Mode / Remarks : Standby Mode Normal Axis

LIMIT : FCC15.109(a) 3m, below 1GHz:QP, above 1GHz:PK
FCC15.109(a) 3m, below 1GHz:QP, above 1GHz:AV



Frequency [MHz]	Reading [dBuV]	DET	Antenna		Level [dBuV/m]	Angle [Deg]	Height [cm]	Polar.	Limit [dBuV/m]	Margin [dB]	Comment
			Factor [dB/m]	Loss& Gain [dB]							
1000.290	64.8	PK	23.9	-35.8	52.9	345	100	Hori.	73.9	21.0	
1000.290	37.3	AV	23.9	-35.8	25.4	345	100	Hori.	53.9	28.5	
1140.065	47.2	AV	24.4	-35.3	36.3	319	100	Vert.	53.9	17.6	
1140.065	52.9	PK	24.4	-35.3	42.0	319	100	Vert.	73.9	31.9	
1500.010	49.4	PK	25.3	-34.6	40.1	198	100	Hori.	73.9	33.8	
1500.010	36.6	AV	25.3	-34.6	27.3	198	100	Hori.	53.9	26.6	
1698.890	50.4	PK	25.9	-34.3	42.0	129	100	Vert.	73.9	31.9	
1698.890	42.7	AV	25.9	-34.3	34.3	129	100	Vert.	53.9	19.6	

CHART: WITH FACTOR ANT TYPE: -30MHz: LOOP, 30-300MHz: BICONICAL, 300MHz-1000MHz: LOGPERIODIC, 1000MHz-: HORN
CALCULATION: RESULT = READING + ANT FACTOR + LOSS (CABLE+ATTEN.) - GAIN (AMP)

*The limit is rounded down to one decimal place.
*The test result is rounded off to one or two decimal places, so some differences might be observed.

APPENDIX 3: Test instruments

EMI Test Instruments

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
MAEC-01	Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 10m	DA-06881	RE/CE	2010/07/02 * 12
MOS-01	Digital Humidity Indicator	N.T	NT-1800	MOS01	RE/CE	2011/02/23 * 12
MJM-01	Measure	KDS	ES19-55	-	RE/CE	-
COTS-MEMI	EMI measurement program	TSJ	TEPTO-DV	-	RE/CE	-
MTR-01	Test Receiver	Rohde & Schwarz	ESI40	100084	RE/CE	2010/12/07 * 12
KBA-05	Biconical Antenna	Schwarzbeck	BBA9106	2513	RE	2010/10/15 * 12
KLA-04	Logperiodic Antenna	Schwarzbeck	USLP9143	361	RE	2010/10/16 * 12
MAT-08	Attenuator(6dB)	Weinschel Corp	2	BK7971	RE	2010/11/05 * 12
MCC-01	Coaxial Cable 0.1-3000MHz	Suhner/storm/Agilent/T SJ	-	-	RE	2010/10/14 * 12
MPA-20	Pre Amplifier	Elena	EPA-4020YA	030801	RE	2011/03/27 * 12
MSA-10	Spectrum Analyzer	Agilent	E4448A	MY46180655	RE	2011/02/15 * 12
MHA-05	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	253	RE	2010/06/29 * 12
MCC-18	Microwave Cable 1G-26.5GHz	Suhner	SUCOFLEX 104	148048-143(1m) / 292410(5m)	RE	2010/09/30 * 12
MPA-01	Pre Amplifier	Agilent	8449B	3008A01671	RE	2011/02/24 * 12
MLS-02	LISN(AMN)	Schwarzbeck	NSLK8127	8127383	CE(AE)	2010/07/04 * 12
MLS-03	LISN(AMN)	Schwarzbeck	NSLK8127	8127384	CE(EUT)	2010/07/28 * 12
MTA-30	Terminator	TME	CT-01	-	CE	2011/01/05 * 12
MCC-03	Coaxial Cable	Fujikura/Suhner/TSJ	5D-2W(20m)/3D-2W(7.5m)/RG400u(1.5m)/RFM-E421(Switcher)	- /01068(Switcher)	CE	2011/01/16 * 12
MAT-64	Attenuator(13dB)	JFW Industries, Inc.	50FP-013H2 N	-	CE	2011/02/22 * 12

The expiration date of the calibration is the end of the expired month.

All equipment is calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

As for some calibrations performed after the tested dates, those test equipment have been controlled by means of an unbroken chains of calibrations.

Test Item:

CE: Conducted Emissions

RE: Radiated Emissions

UL Japan, Inc.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124